CityEngine: An Introduction

Gert van Maren
Product Management lead for 3D
Why 3D GIS?
Because our world is 3D

- **Improve understanding**
  3D is easy for everyone to understand

- **Better communication**
  3D makes it easier to articulate ideas

- **Solve 3D problems**
  Some spatial problems can only be solved in 3D
CityEngine

Transform 2D GIS Data into Smart 3D City Models
CityEngine
Transforms 2D GIS Data into Smart 3D City Models

3D City Creation
2D GIS data + rules

3D City Design
Interactive and rule driven design in 3D

Geometry + Attributes + Rules
Dynamic + Parametric editing
Procedural modeling
3D model creation using rules / algorithms

- Base geometry

Iteratively refine a design by creating more and more detail
Procedural modeling vs. Manual modeling

Time reduction / cost saving
2D GIS Data + Rules
Procedural city modeling

Geometry

Attributes

Rules
3D City Creation
Procedural city modeling

- Rule based 3D cities
Demo - 3D City Creation

- 3D City generation
Aggregate As-built and Procedural Cities

As-built models
• Reality at time of data capture
• Sensor derived
• Exterior shells
• Static models

-> Visualization of existing city

Procedural models
• Approximation of reality
• Based on GIS data
• Rule driven
• Exteriors and interiors
• Dynamic models

-> City planning / design
3D City Design
3D procedural design

Parametric editing

Dynamic editing

Procedural reporting

Rule based design
Demo - 3D City Design

• Dynamic editing
• Manual editing
• Simple urban design
• Inner city densification
3D City (Geo)design
Iterative analysis while designing

- Mass modeling
- Visibility impact
- Shadow impact
- Façade design
- Detailed Façades
- Skyline Analysis
ArcGIS & CityEngine

ArcGIS
- Store
- Analyze
- Visualize
- 2D-to-3D
- Share

CityEngine
- 2D-to-3D
- Edit & Design
- Share

ArcGIS Online
Share 3D Web Scenes

- 3D in the browser
- Easy-to-use (cloud solution)
- For Chrome, Firefox & Safari
- Modern GUI & graphics

Example: Side-by-side view to compare before/after
Example: Share analysis results (Swipe tool)
Share 3D Scenes
CityEngin markets
Garsdale Design Limited

- Urban Planning & Architectural Visualization
  Foster & Partners, Grimshaw,…

- Local government
  - Singapore, Brisbane, …

- Simulation & Defense
  Thales, CS, Raytheon,…

- Entertainment
  - Pixar, DreamWorks, Weta Digital,…

- Academia
  - MIT, ETH, Stanford,…
Master Planning in Iraq
Garsdale Design Limited
Urban Design: Masdar
Urban Design: Masdar
Urban Planning: Zoning Rules

Example Zurich (W2 Zone, Zürichberg)
Investment/Growth Potential

Example Zurich (Seefeld)

BZO Zurich: 49M m² GFA
Currently used: 31M m² GFA
3D Enablement of Auckland Unitary Plan
Portland – 3D land use inventory

analysis of underutilized lots
Townsville - 3D city planning
Virtual Brisbane – modernizing city planning
Simulation and Defense
Entertainment
CityEngine 2013.1

- Rule packages
- SDK
- Improved Streets
- 3D plant library
CityEngine 2014.0

- Built-in Esri rule library
- Improved hole support
- Improved streets
- Unity example plugin
Demo - CityEngine 2014

- Streets
- Esri rule library
Share your 3D Scenes
3D models in the browser and on mobile devices

Share your ArcScene Project as a Web Scene
“Clip and Share”

Stream 3D Scenes to the Browser and Mobile Devices

Supporting Defense, Local Government, Scientists, Urban Planners, Facilities Managers, Geologists, Architects, Landscape Planners…
DEMO – Let’s make a Web Scene…
Useful links

• CityEngine trial
  - http://www.esri.com/software/cityengine

• Resources
  - Resource Center:
  - Forum: http://forums.arcgis.com
  - Ideas: http://ideas.arcgis.com

• Support
  - http://support.esri.com

• Training
  - http://training.esri.com
Thank you...

• Please fill out the session survey:

First Offering ID: 2318
Second Offering ID: XXXX

Online – www.esri.com/ucsessionsurveys
Paper – pick up and put in drop box